

Assignment No.4

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Download latex-tikz codes from

<https://github.com/Panisha707/ASSIGNMENT04/blob/main/main.tex>

Download python codes from

<https://github.com/Panisha707/ASSIGNMENT04/blob/main/untitled24.py>

Question taken from

linear_form, exercises 2.3,i,j

1 QUESTION No 1

Draw the graphs of the following equations

$$a) (1 \ 1) \mathbf{x} = 0 \quad (1.0.1)$$

$$b) (1 \ -1) \mathbf{x} = -2 \quad (1.0.2)$$

2 SOLUTION

$$a) \text{let } \mathbf{x} = \begin{pmatrix} a \\ 0 \end{pmatrix}$$

$$(1 \ 1) \begin{pmatrix} a \\ 0 \end{pmatrix} = 0 \quad (2.0.1)$$

$$\Rightarrow a = 0 \quad (2.0.2)$$

$$\text{similarly let } \mathbf{x} = \begin{pmatrix} 0 \\ b \end{pmatrix}$$

$$(3 \ -1) \begin{pmatrix} 0 \\ b \end{pmatrix} = 0 \quad (2.0.3)$$

$$\Rightarrow b = 0 \quad (2.0.4)$$

$$\mathbf{P} = \begin{pmatrix} 0 \\ 0 \end{pmatrix} \quad (2.0.5)$$

For point \mathbf{Q} ,

$$\text{let } \mathbf{x} = \begin{pmatrix} x \\ y \end{pmatrix}$$

$$(3 \ -1) \begin{pmatrix} x \\ y \end{pmatrix} = 0 \quad (2.0.6)$$

$$\Rightarrow x = 2 \quad (2.0.7)$$

$$\Rightarrow y = 6 \quad (2.0.8)$$

intercept on X and Y axis can be written as

$$\mathbf{P} = \begin{pmatrix} 0 \\ 0 \end{pmatrix}, \mathbf{Q} = \begin{pmatrix} 2 \\ 6 \end{pmatrix} \quad (2.0.9)$$

$$b) \text{let } \mathbf{x} = \begin{pmatrix} a \\ 0 \end{pmatrix}$$

$$(1 \ -1) \begin{pmatrix} a \\ 0 \end{pmatrix} = -2 \quad (2.0.10)$$

$$\Rightarrow a = -2 \quad (2.0.11)$$

$$\text{similarly let } \mathbf{x} = \begin{pmatrix} 0 \\ b \end{pmatrix}$$

$$(1 \ -1) \begin{pmatrix} 0 \\ b \end{pmatrix} = -2 \quad (2.0.12)$$

$$\Rightarrow b = 2 \quad (2.0.13)$$

intercept on X and Y axis can be written as

$$\mathbf{A} = \begin{pmatrix} -2 \\ 0 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} 0 \\ 2 \end{pmatrix} \quad (2.0.14)$$

Graphs of the equations (a) and (b) are constructed by using python as

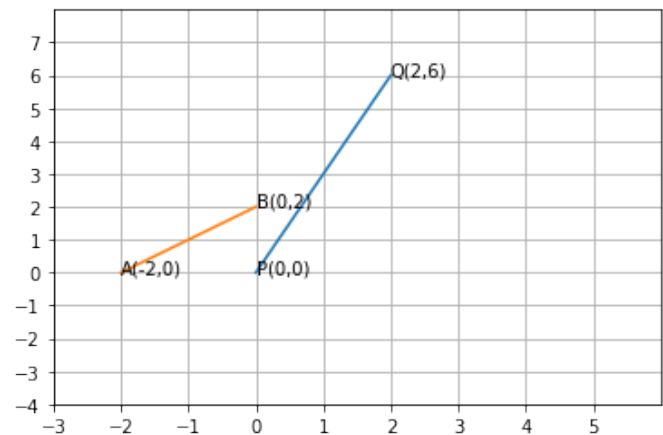


Fig. 2.1: Graphs of Equations (a) and (b)